BOOK REVIEWS

MECHANICS OF MATERIALS—by Prof. Seibert Fairman and Prof. Chester S. Cutshell, John Wiley & Sons, Inc., New York. Price $ 14.95.

The book was first published in the year 1953 and the fourth reprint, which was given for review, came out in the year 1963.

The basic elements of the subject have been carefully selected and incorporated in the book giving complete first course in Strength of Materials.

The book will be very helpful to the students. Many worked out typical problems, to explain the theory, have been included to make it more interesting to the students.

The book deals very lucidly the chapter on deflection of beams, specially the area moment method, and the statically indeterminate beams. The chapter of combined stresses given at the end gives a better understanding of the subject matter to the students.

It is a well planned and well written text book. The unit used in the book is F.P.S. system.

G.C.S.

THE STATISTICAL THEORY OF NON-EQUILIBRIUM PROCESS IN A PLASMA—by Yu. L. Klimontovich, Pergamon Press, 1967. Pp. xv+284. Price 70sh net.

This is an English edition of the original Russian text by Dr. Klimontovich, published by Moscow State University in 1964. The major portion of the material in the book was presented earlier in lectures at the Mechanics and Mathematics Faculty of the University. It should, however, be noted that the present translation by H. S. H. Massey and O. M. Blunn under the editorship of D. Ter Haar incorporates, to its credit, corrections and revisions supplied by the author in 1966.

The book treats the statistical theory of processes in a plasma in terms of equations relating to the microscopic phase densities of each component of the plasma and the microscopic strengths of the electric and magnetic fields. The author starts with a closed system of equations for the random functions of the microscopic quantities, and the problem boils down to determining the moments of the functions. The approximation of the first two moments is mainly dealt with.

The author's approach leads to considerable simplification of the solution of a number of problems in as much as the resulting system of equations in this method is much simpler than the system of very complex equations for the distribution functions of the co-ordinates and momenta of both the particle and the field oscillator.

The book has, under its purview, kinetic equations in the self-consistent field approximation as well as correlation and spectral functions for a spatially uniform or non-uniform plasma. A chapter is devoted to kinetic equations and spectral functions, taking into account the radiation by plasma waves. The first chapter which is of a subsidiary nature presents Maxwell's equations for slow and fast processes while the last chapter gives a hydrodynamic description of processes in a plasma.

Although the treatment, as mentioned by the author in the Introduction, is not exchaustive, t covers quite a wide range of topics in plasma theory by a unified method. The book

can be recommended to students specialising in plasma physics; it is a must for those who intend to work on statistical theories of a plasma.

J.B.

MAGNETOHYDRODYNAMICS—By Andrey Gennadievich Kulikovskiy and Grigoriy Aleksandrovich Lyubimov. Translated from the Russian by Scripta Technica, Inc. (Technical Editor : Ludwig Oster, Yale University, New Haven).

The competent book on the newly developing subject of Magnetohydrodynamics is a valuable addition to the existing texts on the subject. The book presents in a well organised manner the subject of Magnetohydrodynamics. The authors deal with the basic principles of electrodynamics in an elegant manner and proceed ahead introducing the basic equation of fluid dynamics. The conservation laws in writing the equation are emphasised. The authors have given good application of the equation and presented the solution of some solvable problems. It is very instructive to learn the techniques and the way of handling the equation of Magnetofluid-dynamics. The chapters on shock waves in Magnetohydrodynamics and further treatment of propagation of weak shock waves and the structure of shock waves give a clear description of the subject. The book can serve a good text for a student entering in this field for the first time.

The Scripta Technica and its technical Editor are to be thanked for making a valuable book like this available to English knowing workers in the field.

A.C.B.

PLASMA DYNAMICS—edited by F. H. Clauser, 1960. Addison-Wesley Publishing Company, Inc. Pp. ix+369. List Price 12.50 dollars.

The book is an edited version of the proceedings of an international symposium on plasma dynamics, held at Massachusetts, USA in June 1958. The symposium, in which quite a few renowned scientists took part, covered the many-sidedness of plasma dynamics, as reflected in the fields of thermonuclear physics, gas discharges, electron beam dynamics, statistical mechanics, fluid mechanics, aerodynamics and astrophysics; all the aspects have, naturally been reproduced in the symposium volume, which thus presents plasma dynamics in a very broad and integrated manner.

Each chapter of the volume is based on an introductory speech, followed by discussions, discourses and comments. That plasma dynamics is a living and intriguing subject is aptly borne out by a number of contradictory views.

As the symposium was meant for experts, the volume might appear, to a non-specialist, somewhat sketchy, lacking in details. However, by way of compensation, the interested reader would find a long list of references in the bibliography, which is of particular help because of its topicwise arrangement.

J.B.

GAMMA-RAYS OF NUCLIDES IN ORDER OF INCREASING ENERGY—By D. N. Slater. Published by Butterworths, London, 1962. Price 45sh.

During the last decade identification and description of the members of gamma-ray emitting nuclides have proceeded at an enormous pace. Knowledge of their individual characteristics have been classified and reported in several journals and Nuclear data tables. However a periodic census is necessary to keep the active research workers abreast of the new developments in the field. The compilation of the present volume is such a census. It provides a list of energies of gamma-rays emitted by radio-nuclides, arranged in order of

increasing magnitude. It has been prepared particularly to assist in the identification and elucidation of the gamma-scintillation spectra. The author has based his compilation upon some predecessors [1,2,3,4]. He has also selected "preferred values" of gamma-ray energies (in Mev) from the Table of Isotopes of Strominger *et al*[1]. This has simplified the compilation to a remarkable extent. On the other hand if he had emphasized the discrepancies they might have served as a stimulus for new work.

The classification of entries in the table are the following :

(a) Photon-energy (Mev), arranged in order of increasing magnitude.

(b) Nuclides (including metastable existed states).

(c) Half-life.

(d) Modes of formation.

(e) Percent abundance of relevant stable isotope.

(f) Thermal neutron activation cross-section (Barns) or Fission yield.

(g) Per cent abundance of gamma-radiation.

(h) Genetic relationship.

The book would be a very useful manual for the gamma-ray spectroscopists in particular. The printing and get up of the volume are excellent.

S.D.C.

1. Strominger, D., Hollander, J. M. and Seaborg, G. T., *Revs. Modern Phys.*, **30**, No. 2, Part 2, April, 1958.
2. Crouthanel, C. E. Applied Gamma-ray Spectrometry. Pergamon Press, 1960.
3. Hollander, J. M., Perimon, I. and Seaborg, G. T., *Revs. Modern Phys.*, **25**, 1953, 469.
4. Bainbridge, K. T. and Nier, A. O., *Nat. Res. Coun. Nuclear Energy Ser.*, Prelim. Rep. No. 9, Dec., 1950.